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(71) Applicant(s)
Motorola Limited

(Incorporated in the United Kingdom)

European Intellectual Property Operation, Jays Close,
Viables Industrial Estate, BASINGSTOKE, Hampshire,
RG22 4PD, United Kingdom

(72) Inventor(s)
William Neil Robinson
Nicholas William Whinnett
Jonathan Alastair Gibbs
Dragan Boscovic
Anthony Patrick Van Den Heuvel

(74) Agent and/or Address for Service
Sarah J Spaulding
Motorola Limited, European Intellectual Property
Operation, Midpoint, Alencon Link, BASINGSTOKE,
Hampshire, RG21 7PL, United Kingdom

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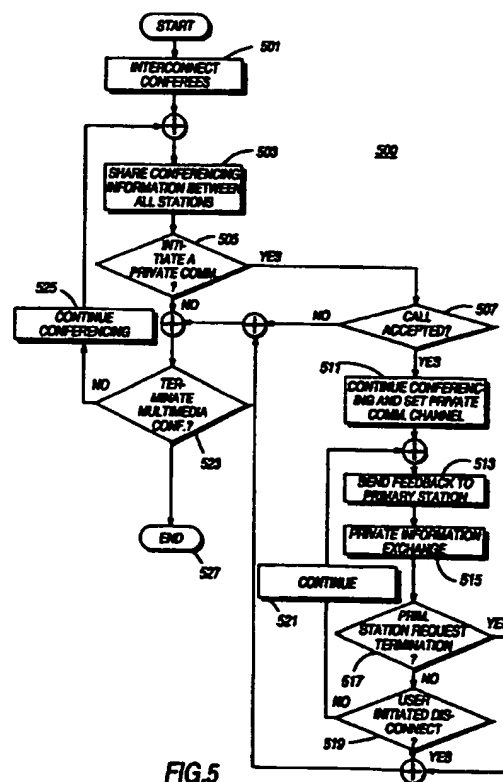
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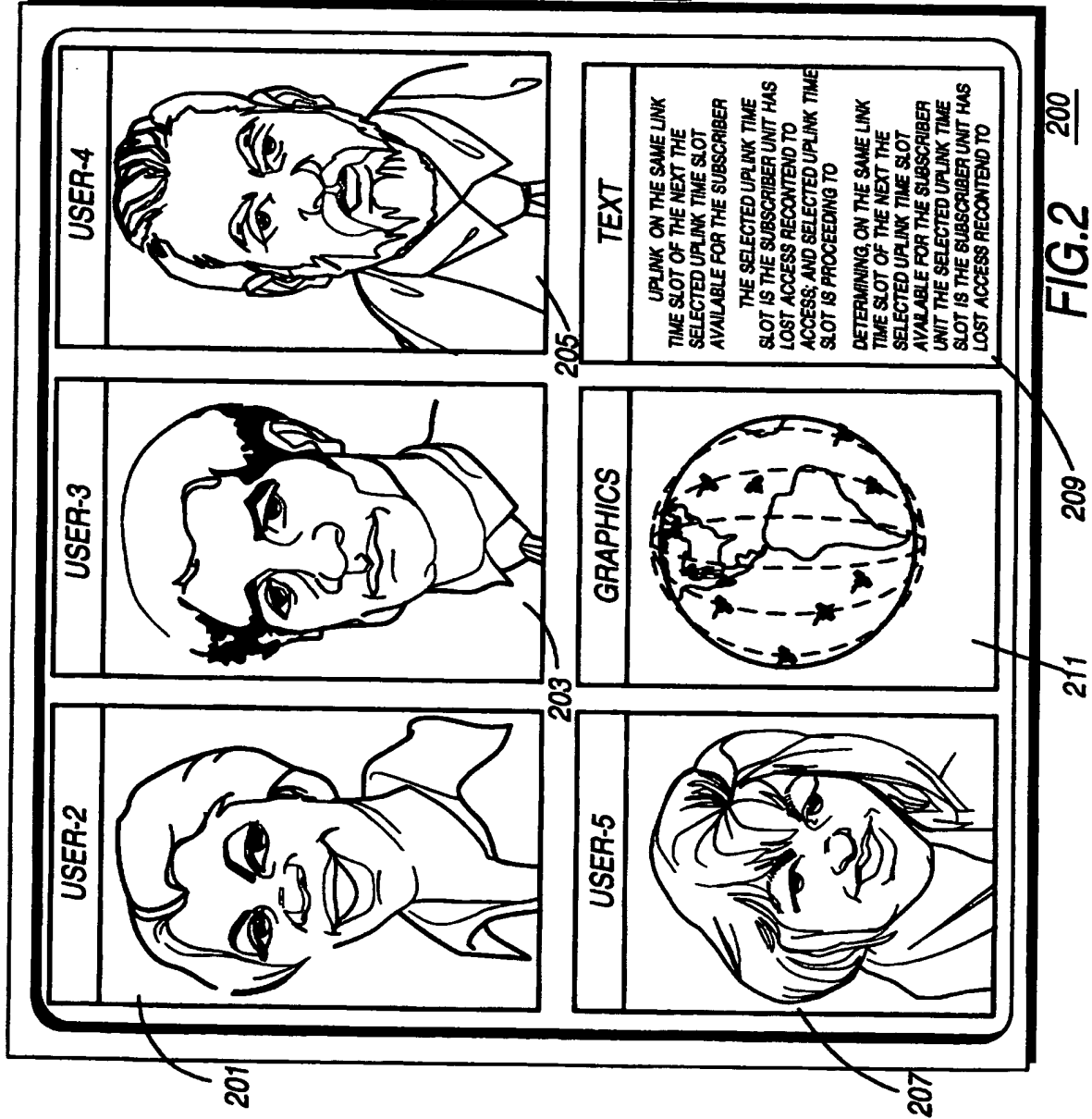
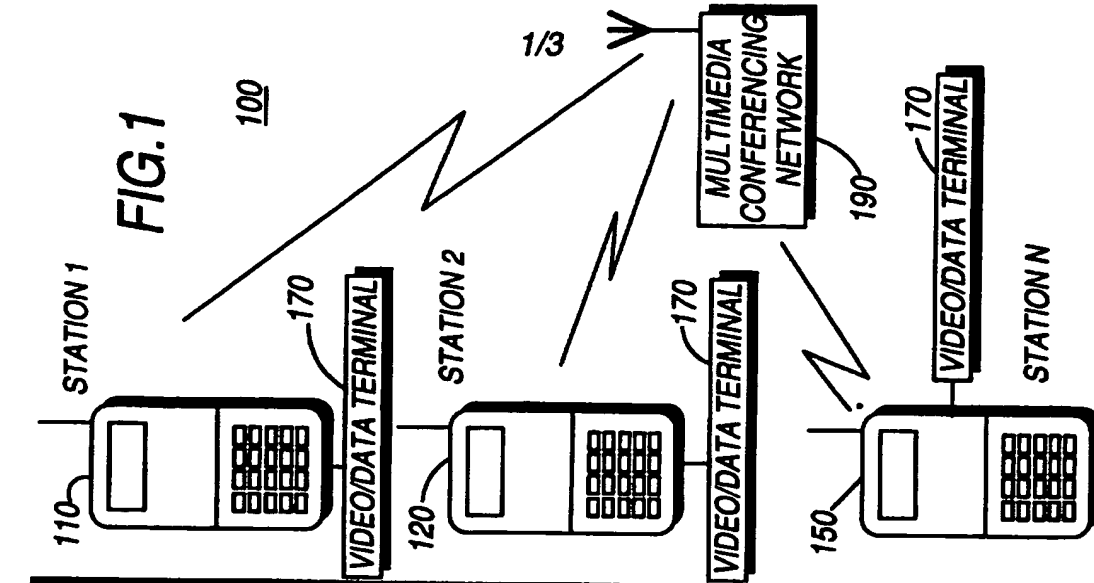
(58) Field of Search
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(54) Exchanging private communication during a multimedia conference call

(57) A multimedia conference call is established 501, 503 between a plurality of stations using at least one media in a plurality of available media, such as voice, video, textual and graphical. During the conference call, a private communication may be set up 505, 507, 511 using at least one of the media between two or more of the stations without interrupting the conference call and with the private communication being exclusive of the information exchanged in the conferencing mode. The private communication may use a sub-channel of a main channel used for the conference communication. A primary station which set up the conference call, or another station not involved in the private communication, may receive information 513 that a private communication is in progress but is not capable of determining the content of the private communication. Such primary or other station may, however, initiate termination 517 of the private communication.



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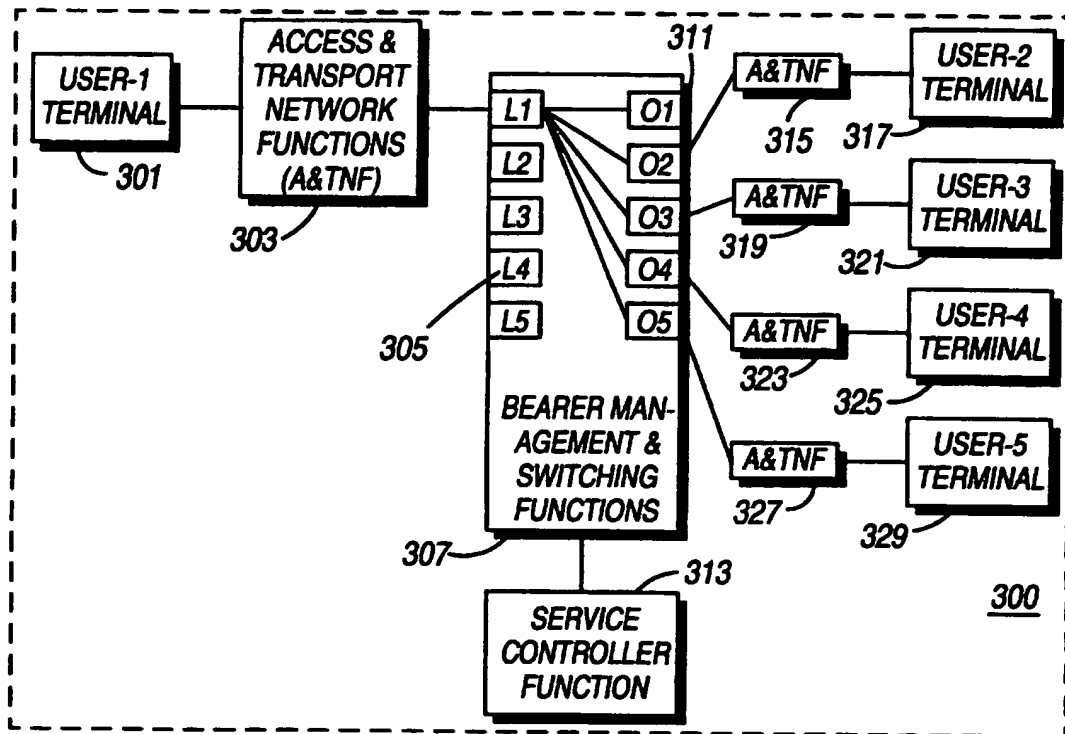


FIG. 3

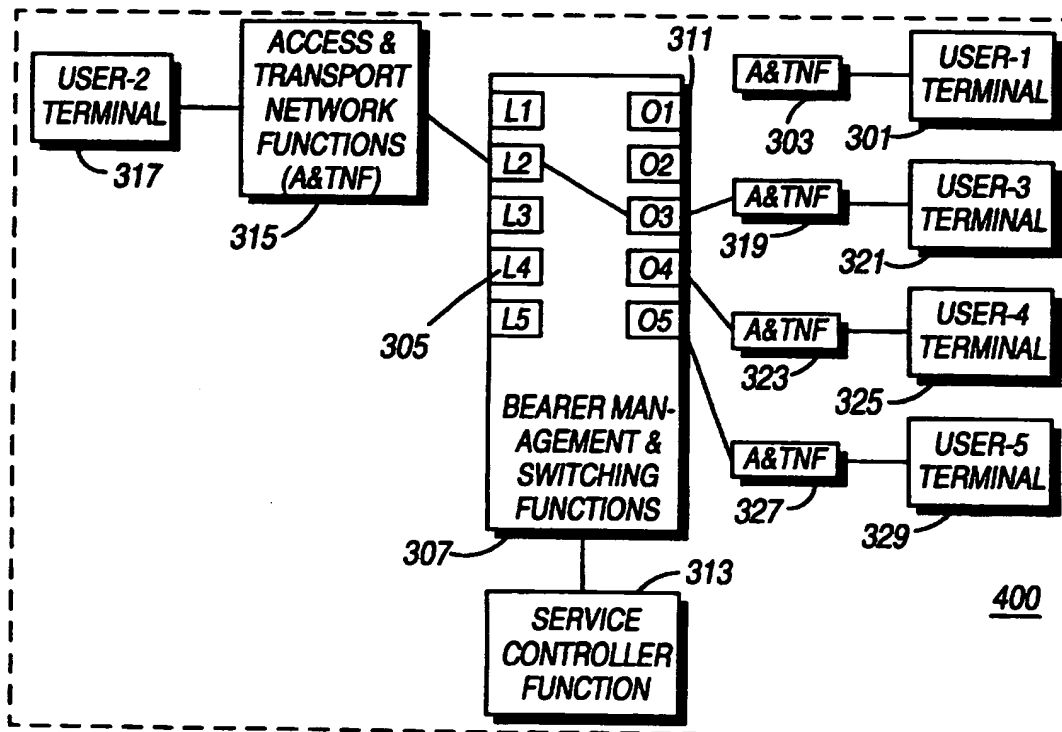


FIG. 4

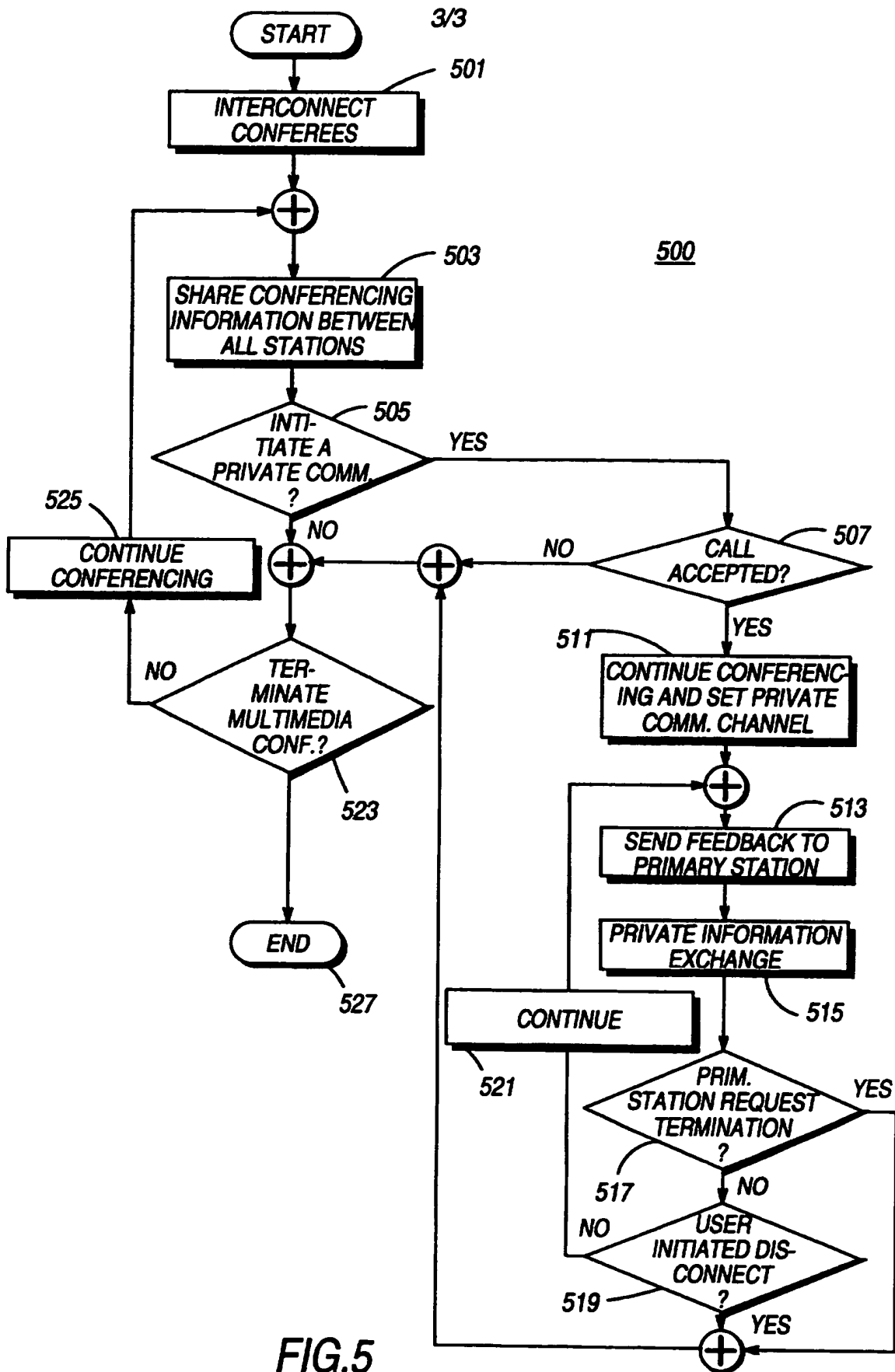


FIG.5

MULTIMEDIA COMMUNICATIONS CONFERENCING SYSTEM AND METHOD OF EXCHANGING PRIVATE COMMUNICATION

Field of the Invention

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This invention relates in general to multimedia communication and more particularly to conferencing communication in a multimedia conferencing network.

10 Background of the Invention

Technological advancement has created an ever increasing need for rapid and reliable communication for personal use as well as for business and industry. Most often, these communications are only required between
15 two persons or stations however there are many situations in which a conference group must be established between three or more persons in multiple locations.

During conferencing, a communications network is specifically adapted to accommodate multiple conferencing stations at any number of
20 remote locations. These stations can then be simultaneously addressed with all information shared between each station throughout the conference group. Thus, once a conference call is formed, interparty communications are exchanged openly with all information made equally available to all stations in the conference group.

25 Additionally, there are often situations in which differing modes of communication i.e. different media, other than voice are required. As one may note during a typical telephone conversation, a person's voice alone often cannot adequately convey all necessary information to a one or more conferees in the call. During these times, persons must often rely on other
30 forms of media such a facsimile or electronic mail to receive text and image information. Obviously, this can create any number of problems since the text and data cannot be simultaneously presented with the a voice. Consequently, the substance and character of the presenter's information are not properly conveyed to the conferees with a speaking voice alone, and
35 the information's true meaning or content can be lost.

This most recently has led to multimedia type conferencing communications using integrated service digital networks (ISDN) where voice and video can be presented at the same time. Moreover, there is envisioned a Universal Mobile Telecommunications System (UMTS) which is planned to support mobile multimedia services. One communication scenario which UMTS is expected to support is the Multimedia Conference Call. This is a call which enables a number of people to hold a meeting without needing to be physically present in the same location. Multimedia facilities in support of such a conference include the delivery of voice, video, text, still images and other forms of data.

One situation often occurs during the course of a multimedia conference call. As happens during an actual conference, with many individuals sitting in one location, there are times when it is necessary only to convey interparty information. Interparty information is that data exchanged only between two or more conferees. During an actual conference, persons can pass private information amongst themselves using notes, whispers or gestures. Presently however, this type of communication is not possible during a multimedia conference call since any information is equally shared with all those in the conference. There is no means by which to converse or send private or confidential information only between two or more parties during the call.

Thus, the need exists to provide a method which allows for an interparty or interconference communication among two or more conferees during an multipoint multimedia conferencing call comprising any number of conferees.

Summary of the Invention

Briefly, according to the invention, there is provided a multimedia communication conferencing system comprising a plurality of multimedia stations for communicating multimedia information in a conferencing mode; and a network controller for providing multimedia conferencing resources to the plurality of multimedia stations and for controlling at least one private communication between the plurality of multimedia stations during a multimedia conference that is exclusive of the multimedia information exchanged in the conferencing mode.

A method is also provided A method for exchanging private information during a multimedia conference call comprising the steps of: establishing a conference communication among a plurality of stations using at least one media in a plurality of media; and initiating a private
5 communication using at least one media of the plurality of media between two or more stations in the plurality of stations without interfering with the conference communication wherein information exchanged during the private communication is exclusive of the conference call communication.

10 Brief Description of the Drawings

FIG. 1 is a block diagram illustrating a typical multimedia conferencing communication among a plurality of stations.

15 FIG. 2 is a pictorial representation illustrating the display of voice, video, text and graphical information at a multimedia terminal.

FIG. 3 is a block diagram illustrating a typical multimedia terminal system which depicts the switching configuration among the plurality of stations during a multimedia conference call.

20 FIG. 4 is a block diagram illustrating a switching configuration showing a private conference during the multimedia conference call as seen in FIG. 3.

FIG. 5 is a flow diagram illustrating the exchange of private information and primary station notification during a multimedia conference call.

25

Detailed Description of the Preferred Embodiment

Referring to FIG. 1, there is shown a multipoint multimedia conferencing system 100 according to the preferred embodiment of the
30 invention having three communications terminals or stations 110, 120, and 150. The communications terminals 110, 120, and 150 are shown as wireless communications devices that can be used with or include two-way radio equipment or cellular telephones. It will also be recognized by those skilled in the art, that although shown in a wireless environment, the
35 multipoint multimedia conferencing environment can also be used in a fixed or hard wired configuration with physical interconnection.

Each of the communications terminals 110, 120 and 150 include an audio, video and/or data terminal that is integrated with, or connects to, the communications terminal for transmitting and receiving any number of multimedia services. These multimedia services include audio, video, text,
5 graphic or special data information that can be presented to the user in any number of formats. Thus, in order to fully convey message content within a communication, the communications terminal 110, 120 and 150 will give a user the capability to simultaneously use a variety of media to adequately convey a message to one or more recipients.

10 For example, a person may wish to give a presentation to a number of conferees who are not physically located near that person. In this case, a multimedia conferencing call can be placed with a number of desired conferees or stations. Any conferees, who are members of the communication group and desire to receive multimedia information, would
15 be required to have the appropriate multimedia communications equipment in order to receive each mode of media information transmitted by the initiator or the conference.

In use, each of the communications terminals 110, 120 and 150 transmit and receive multimedia information using a multimedia
20 conferencing network 190. The multimedia conferencing network 190 works as a network controller providing a central location or node for processing and control of the various forms of multimedia information. Additionally, the multimedia conferencing network 190 works to coordinate the transfer of multimedia conferencing information in such a way that each of the
25 terminals 110, 120 and 150 can communicate and interact no matter which types of media they have available. In order to remain consistent with prospective Universal Mobile Telecommunications System (UMTS) standards, the multimedia conferencing network 190 can also be interconnected into a trunked or cellular type radio network arrangement in
30 order to provide an increased coverage area with handover capability. This would allow each station to become mobile and be used over a wide geographic range even further increasing the network versatility.

FIG. 2 shows a pictorial representation illustrating the display of voice, video, text and graphical information at a video/data terminal 170. In
35 this example, User- 1's screen is segmented and displays real time video pictures of User-2 201, User-3 203, User-4 205 and User-5 207. Each user is

separated into their own video block that represents a station that is a participant in the multipoint multimedia conference call. Additionally, textual information 209 and graphical information 211 are each shown in a separate video blocks. During the multimedia conference call, the textual
5 information 209 and the graphical information 211 help to aid User-1, who is viewing the other participants in the multimedia conference call, in understanding the true content of any information or data that may be discussed or presented during the conference.

FIG. 3 illustrates a typical multimedia terminal system 300 which
10 depicts the switching configurations among the plurality of users during various stages of the multimedia conference call. The video/data terminal 301 for User-1 is generally connected with an access and transport network (ATNF) which acts to convert the various multimedia modes to a common format or protocol that can be recognized by the video/data terminal. Thus,
15 the ATNF 303 is capable of converting any of the multimedia modes such as audio, video, or other forms of data to a common protocol used by the video/data terminal 301 for presentation to another station. In FIG. 3, it is presumed that information flows from the left to right i.e. FIG. 3 represents a portion of a multimedia communication when information and data are
20 moving from the User-1 to the other User-2 through User-5. Moreover, FIG. 3 shows that the ATNF is electrically connected with a bearer management and switching function network (BMSF) 307. It will be recognized by those skilled in the art that a wireless connection is also possible as shown in FIG. 1 using a radio frequency (RF), infrared (IR) or other type of wireless link.

25 The BMSF 307 is an electronic switching network for receiving information and data, from the input port connections 305, in the ATNF 303, and connecting them to the appropriate output port connections 311. The input port connections 305 and the output port connections 311 are divided in a series of input ports (I1 to I5) and output port (O1 to O5) which receive
30 and transmit information to the respective ATNF for processing. The input port connections 305 and output port connections 311 provide for an orderly flow of information and data from one video/data terminal 301 to others during the course of a multimedia conference call.

A service controller 313 is connected to the BMSF 307 and provides
35 microprocessor control insuring rapid control and switching of information and data flowing between users. As seen in FIG. 3, the BMSF 307 is

interconnecting information and data between the input port I1 to all output ports O1 through O5. It should be recognized that the microprocessor control is required since system parameters and conditions are changed at very high speeds. Since switching speeds and bandwidth requirements differ with each media, the switching functions are required to be highly dynamic. This provides an efficient bi-directional exchange of information between users during the multimedia conference without error or delay. Further, at the respective output ports (O1 through O5), the switched information and data is passed to each respective ATNF 315, 319, 323, and 327 for each of the stations, User-2 327, User-3 321, User-4 325 and User-5 329.

During the course of the multipoint multimedia conference call as seen in FIG. 3, there are often moments when it is necessary to carry on one or more private communications between two or more users. For example, since User-1 is shown sending information to User-2 through User-5, a situation can arise when it is necessary for User-2 to speak privately to User-3. As seen in FIG. 4, User-2 can then initiate an inter-conference private communication with User-3.

In this example, information is shown moving through the ATNF 315 and BMSF 307 to the output port O3 and on to User-3 through the ATNF 319. The information exchanged between User-2 and User-3 can be one or more of the multimedia modes mentioned above. Thus, it may be an audio message, graphical information 211 or a textual message like textual information 209 as seen in FIG. 2.

In either event the communication is private and is not shared amongst the other users or stations which are participating in the multimedia conference call. The private communication is transmitted concurrently with all conferencing information and data such that any stations which are participating in the private conversation will continue to receive all information simultaneously without interruption or delay. Hence, the private communication is established within the context of an ongoing multipoint multimedia call by control message exchanges between user, the user's video/data terminal and service controller 313 in the network which is providing the multipoint multimedia service.

The private messages and communications are possible between any number of stations participating in the multimedia conference call and

provide a means by which rapid communication between conferees, in the conference group, can occur without the burden of delaying the multimedia conference providing there was enough additional bandwidth capacity on the network. This allows time for the stations desiring the private communication to confer without interruption.

According to a second embodiment of the invention, during the course of a multimedia conference call, the primary station may note that one or more private communications are in progress. In order to keep control and order during the multimedia conference, the primary station has the capability of monitoring the presence of interstation communications that are occurring during the multimedia conference. Although the primary user does not have the capability to determine the content of these private communications, the primary station does have the capability to determine that they are occurring and are in progress.

Monitoring or prompting information, indicating that a private communication is in progress will be available to the primary station in the multimedia conference. This information can take the form of an interconnecting bar joining two or more of the video blocks (201, 203, 205, 207), cross hatching in the video block or pulsing or blinking portions thereof. This information will be displayed on the primary station's video/data terminal 170 so as the primary user has this information available to determine activity amongst the users or conferees.

Since stations other than a primary station may be granted an authority to intervene and disconnect any private communication between two or more stations, there can be situations that this intervention authority can be assigned. Hence, the authority for the intervention can be assigned by one of more of the following: a) preprogrammed assignment of intervention authority to specific user's in the multimedia network; b) assignment of authority set according to the primary station or user who set up the conference call; c) intervention authority available to any station on request; or d) intervention authority may be negotiated at call setup by some predetermined arrangement.

In FIG. 5, a flow chart illustrates the progress and initiation of a multipoint multimedia conference call 500 between a primary station and a plurality of secondary stations herein collectively referred to as conferees. A multipoint conference communication is established 501 among the

conferees using at least one media in a plurality of media such as audio, video, textual or graphical information. After the multimedia conference call has been established, all information is shared 503 equally among all conferees such that all information which is transmitted by any one of the stations is received by all other stations.

Sometime during the course of the multimedia conference call, if two or more conferees which to initiate 505 a private communication among themselves, private information can be exchanged 515 within the context of the multimedia conference call. During the initiation of the private communication, a conferee can receive 507 a request for a private communication. Should the private communication not be desired or accepted, the multimedia conference call can be terminated 523 or multimedia conferencing can continue 525 among the conferees.

If the private communication is accepted 507, the multimedia conferencing is continued 511 and the private communications channel within the context of the multimedia conference call will be established. Once the private combination is established, this information is processed and sent 513 to the primary station who is in charge of the conference call. This information or feedback is conveyed to the primary station for notification purposes. Subsequently, the private communication is exchanged 515 and the primary station has the option to request 517 a termination of one or more of the private communications in order to maintain control and/or order during the course of the multimedia conference call. In the event that the primary station does request 517 termination of the private communication, a decision is then made whether to terminate 523 the multimedia conference call or to continue 525.

Should the a station participating in the private communication desire to initiate 519 a disconnect of the private communication, then a decision is again main to terminate 523 the multimedia conference call or continue 525 conferencing. If no disconnect is initiated 519 nor desired, by the participants in the private communication, this private communication can continue 521 until such time as it is no longer desired where the multimedia conference call can terminate 523 or continue.

To reiterate, the private communication can utilize one or more media forms available for use in the multimedia conferencing network and is established on a sub-channel within the main channel used for the

conference communication. The multimedia conferencing information conveyed by a primary station will then be distributed to the all of the secondary stations during the time period the private information is being exchanged. Although the primary station transmitting the conferencing
5 information cannot hear or interpret the context of the private communication, the primary station will be notified 513 and can discontinue or terminate 517 one or more of the private communications if desired. Afterward, only the multimedia conference call information is continued 525 among the stations involved in the conference until the end 527 of the
10 conference call.

While the preferred embodiments of the invention have been illustrated and described, it will be clear that the invention is not so limited. Numerous modifications, changes, variations, substitutions and equivalents
15 will occur to those skilled in the art without departing from the spirit and scope of the present invention as defined by the appended claims.

What is claimed is:

Claims

1. A multimedia communication conferencing system comprising:
a plurality of multimedia stations for communicating multimedia
5 information in a conferencing mode; and
a network controller for providing multimedia conferencing resources
to the plurality of multimedia stations and for controlling at least one
private communication between the plurality of multimedia stations during
a multimedia conference that is exclusive of the multimedia information
10 exchanged in the conferencing mode.
2. A multimedia communication conferencing system as in claim 1 wherein
the network controller informs a primary station within the plurality of
multimedia stations of the at least one private communication.
15
3. A multimedia communication conferencing system as in claim 2 wherein
the at least one primary station can inform the network controller to
terminate any private communication.
- 20 4. A method for exchanging private information during a multimedia
conference call comprising the steps of:
establishing a conference communication among a plurality of stations
using at least one media in a plurality of media; and
initiating a private communication using at least one media of the
25 plurality of media between two or more stations in the plurality of stations
without interfering with the conference communication wherein information
exchanged during the private communication is exclusive of the conference
communication.
- 30 5. The method of claim 4 wherein the plurality of media comprises audio,
video, text, data and graphical information.
6. The method of claim 4 wherein the step of establishing comprises forming
the conference communication on at least one main channel.

7. The method of claim 6 wherein the step of establishing comprises forming the private communication on at least one sub-channel within the at least one main channel.

5 8. The method of claim 4 wherein the step of establishing further comprises the step of:

originating the conference communication with a primary station and communicating with a plurality of secondary stations wherein the primary station is capable of monitoring and disconnecting any private
10 communication among two or more secondary stations to maintain order in the conference communication.

9. The method of claim 4 wherein the multimedia conference call is established using a wireless link.

15

10. A method for communicating private information amongst a plurality of stations during a multimedia conference call comprising the steps of:

establishing a multimedia conference call on a main channel for exchanging conference information between a plurality of stations using at
20 least one media in a plurality of media; and

initiating at least one private communication between two or more stations in the plurality of stations on a sub-channel within the main channel that is exclusive of the conference information exchanged during the multimedia conference call.

25

11. The method as in claim 10 wherein the at least one media includes audio, video, text, data and graphical information.

12. The method of claim 10 wherein the step of establishing comprises:

30 forming the multimedia conference call between a primary station and a plurality of secondary stations wherein the primary station can monitor and terminate any private communication initiated between two or more stations in the plurality of stations.

13. A method of exchanging private information during a multimedia conference communication having a plurality of conferencing stations comprising the steps of:

5 exchanging conferencing information using at least one multimedia mode. among each station in a plurality of conferencing stations; and
 exchanging interconference information, using at least one multimedia mode among at least two stations within the plurality of stations, that is private and exclusive of the conferencing information in the multimedia conference communication.

10

14. The method of claim 13 wherein the at least one multimedia mode includes at least one of audio, video, textual and graphical information.

15 15. The method of claim 13 wherein the step of exchanging conferencing information further comprises:

 forming the multimedia conference communication using a primary station that communicates with a plurality of secondary stations wherein the primary station can disallow the interconference information from being exchanged between secondary stations.

20

16. The method of claim 13 wherein the multimedia information is exchanged using a wireless cellular network.

25 17. The method for exchanging private information during a multimedia conference call substantially herein described with reference to FIG. 5 of the accompanying drawing.



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Claims searched: 1 to 17

Examiner: M J Billing
Date of search: 24 July 1996

Patents Act 1977
Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.O): H4K KF56, KF56A, KOD8, KOT.

Int Cl (Ed.6): H04L 12/18; H04M 3/56; H04N 7/15; H04Q 7/22, 7/38.

Other: ONLINE : WPI.

Documents considered to be relevant:

Category	Identity of document and relevant passage		Relevant to claims
X,E	EP0715467A1	(CANON) - page 7 line 54 to page 8 line 39; published 5 June 1996	1,4,10,13 at least
X	EP0680190A2	(A T & T) - Figs.1,10; column 2 line 49 to column 3 line 13, column 6 line 46 to column 7 line 1, column 8 lines 39-57	1,4,10,13 at least
X	US5034947	(CONFERTECH) - Fig.11; Abstract, column 1 lines 13-20	1,4,10,13 at least
X	US3912874	(A T & T) - Abstract, column 4 line 60 to column 5 line 34	1,4,10,13 at least

X Document indicating lack of novelty or inventive step
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